

CLAIMS

1. A method of treating a transplant , comprising:
administering to the transplant a vesicle, comprising:
 - (i) a T cell-apoptosis-inducing molecule, and
 - (ii) a phospholipid which is a stable vesicle former,wherein the vesicle has a fusion rate of at least 20 vesicle fusions/second.
2. The method of claim 1, wherein the T cell-apoptosis-inducing molecule comprises a lipid moiety.
3. The method of claim 2, wherein the T cell-apoptosis-inducing molecule further comprises a biotin moiety.
4. The method of claim 3, wherein N-biotinoyl-1,2-dihexadecanoyl-*sn*-glycero-3-phosphoethanolamine comprises the lipid moiety.
5. The method of claim 3, wherein the T cell-apoptosis-inducing molecule comprises a chimeric polypeptide of avidin or streptavidin.
6. The method of claim 5, wherein the T cell-apoptosis-inducing molecule comprises a chimeric polypeptide of FasL.
7. The method of claim 1, wherein the transplant is heart or skin.
8. The method of claim 1, wherein the vesicle has a fusion rate of at least 10^3 vesicle fusions/second.
9. The method of claim 1, wherein the vesicle further comprises ATP.
10. A method of treating a transplant , comprising:
administering to the transplant a vesicle, comprising:

(i) a phospholipid which is stable vesicle former,
(ii) at least one member selected from the group consisting of another polar lipid, PEG, a raft former and a fusion protein, and
(iii) a lipid,
5 wherein the vesicle has a fusion rate of at least 20 vesicle fusions/second.

11. The method of claim 10, wherein the T cell-apoptosis-inducing molecule comprises a lipid moiety.

12. The method of claim 11, wherein the T cell-apoptosis-inducing molecule further comprises a biotin moiety.

13. The method of claim 12, wherein N-biotinoyl-1,2-dihexadecanoyl-*sn*-glycero-3-phosphoethanolamine comprises the lipid moiety.

14. The method of claim 12, wherein the T cell-apoptosis-inducing molecule comprises a chimeric polypeptide of avidin or streptavidin.

15. The method of claim 14, wherein the T cell-apoptosis-inducing molecule comprises a chimeric polypeptide of FasL.

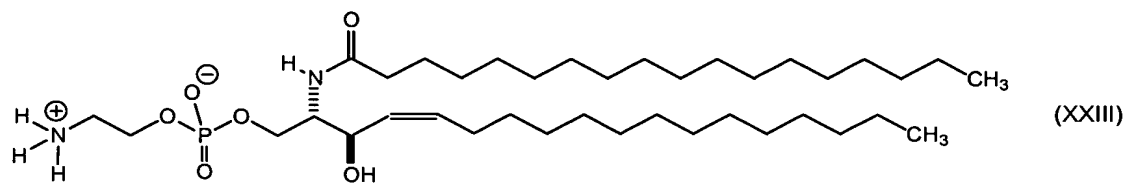
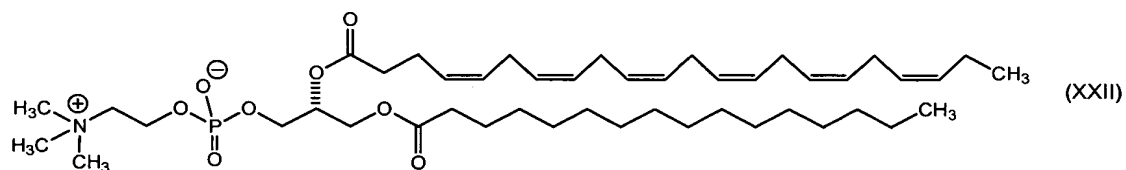
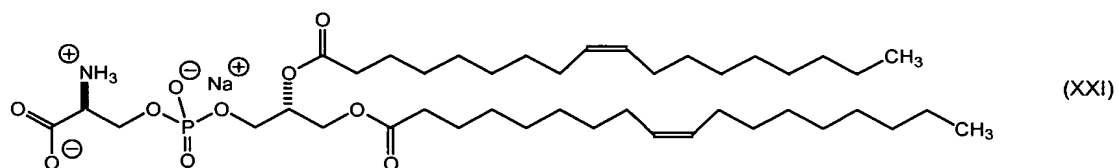
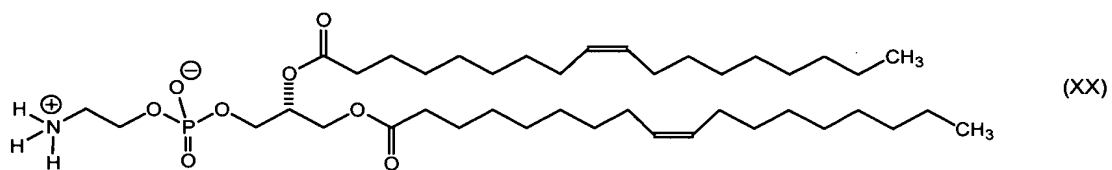
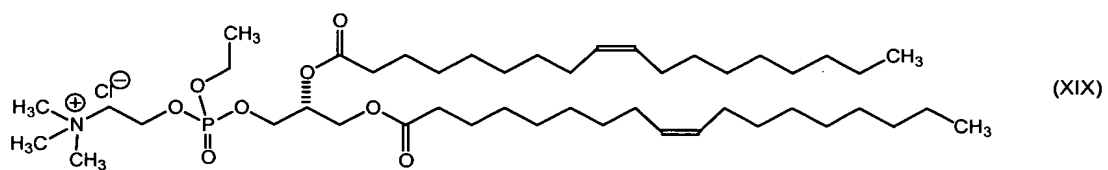
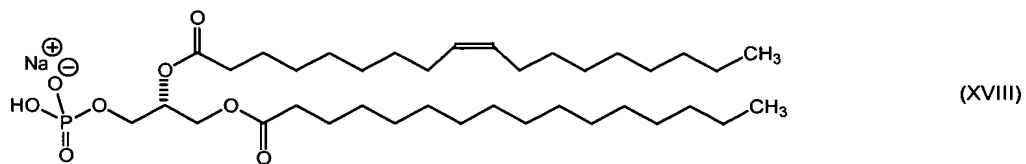
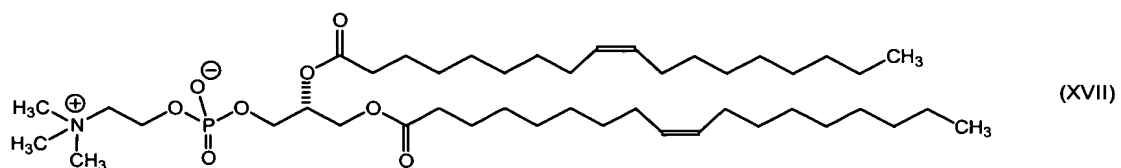
16. The method of claim 10, wherein the transplant is heart or skin.

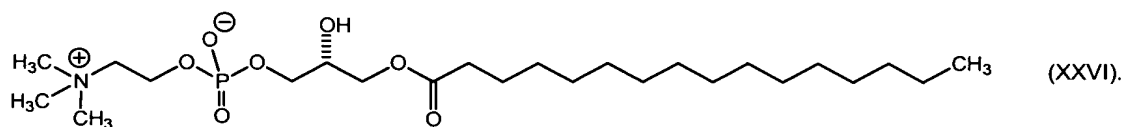
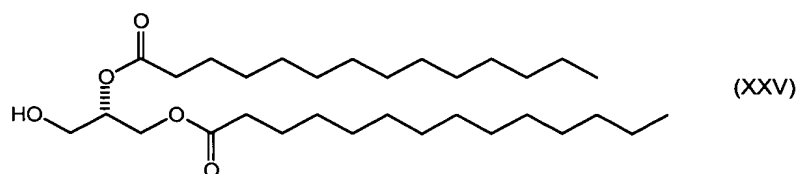
17. The method of claim 10, wherein the vesicle has a fusion rate of at least 10^3 vesicle fusions/second.

18. The method of claim 10, wherein the vesicle further comprises ATP.

19. A method treating a transplant, comprising administering to the transplant a T cell-apoptosis-inducing molecule.

20. A vesicle, comprising:
a phospholipid which is a stable vesicle former; and
a T cell-apoptosis-inducing molecule.
- 5
21. The vesicle of claim 20, wherein the T cell-apoptosis-inducing molecule comprises a lipid moiety.
22. The vesicle of claim 21, wherein the T cell-apoptosis-inducing molecule further comprises a biotin moiety.
- 10
23. The vesicle of claim 22, wherein N-biotinoyl-1,2-dihexadecanoyl-*sn*-glycero-3-phosphoethanolamine comprises the lipid moiety.
- 15
24. A vesicle, comprising:
- (i) a T cell-apoptosis-inducing molecule,
 - (ii) a phospholipid which is stable vesicle former, selected from the group consisting of 1,2-dioleoyl-*sn*-glycero-3-phosphocholine, 1-palmitoyl-2-docosahexaenoyl-*sn*-glycero-3-phosphocholine and a mixture thereof, and
 - (iii) at least one member selected from the group consisting of a polar lipid which is not a stable vesicle former and PEG,
- 20
- wherein the polar lipid which is not a stable vesicle former has a structure selected from the group consisting of formulas (XVII), (XVIII), (XIX), (XX), (XXI), (XXII), (XXIII), (XXV) and (XXVI)





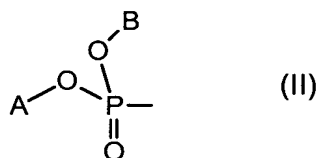
and

wherein the phospholipid which is stable vesicle former has a structure of

5 formula (I)



wherein X is H, or has a structure of formula (II)

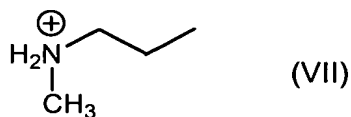
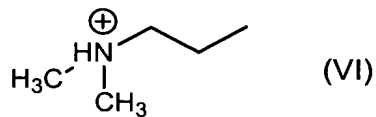
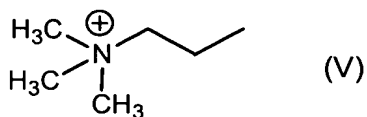
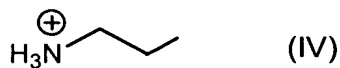
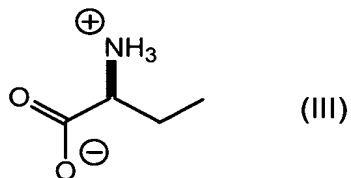


B is a cation or an alkyl group,

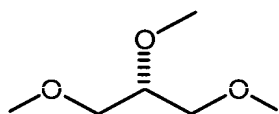
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A is H, or has a structure selected from the group consisting of formulas

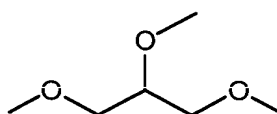
(III), (IV), (V), (VI) and (VII)



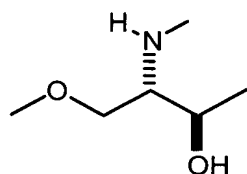
L has a structure selected from the group consisting of formulas (VIII), (IX) or (X)



(VIII)



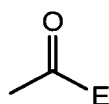
(IX)



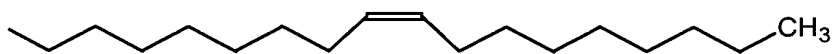
(X)

and E has a structure selected from the group consisting of (XII), (XIII), (XIV),

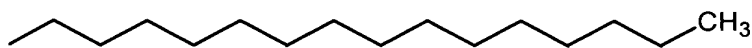
5 (XV) or (XVI)



(XI)



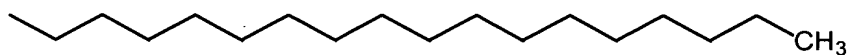
(XII)



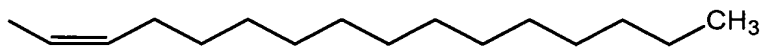
(XIII)



(XIV)



(XV)



(XVI)

25. The vesicle of claim 22, wherein the T cell-apoptosis-inducing molecule comprises a chimeric polypeptide of avidin or streptavidin.
26. The vesicle of claim 25, wherein the T cell-apoptosis-inducing molecule comprises a chimeric polypeptide of FasL.
27. The vesicle of claim 20, wherein the transplant is heart or skin.
28. The vesicle of claim 20, wherein the vesicle has a fusion rate of at least 20 vesicle fusions/second.
29. The vesicle of claim 20, wherein the vesicle has a fusion rate of at least 10^3 vesicle fusions/second.
30. The method of claim 20, wherein the vesicle further comprises ATP.
31. The vesicle of claim 20, wherein the lipid is N-biotinoyl-1,2-dihexadecanoyl-*sn*-glycero-3-phosphoethanolamine, and the T cell-apoptosis-inducing molecule is a chimeric polypeptide of a FasL polypeptide and at least one biotin-binding domain.
32. A transplant contacted with a vesicle of claim 20.
33. A method of transplanting a transplant, comprising:
contacting the transplant with a vesicle of claim 20; and
transplanting the transplant.
34. The method of claim 33, wherein the donor and recipient are immunohisto-incompatible.
35. A method of transplanting a transplant, comprising:

transplanting a transplant into a recipient without administering immunosuppressive therapy.

5 36. In a method of transplanting a transplant, including
 transplanting a transplant into a recipient,
 administering to the recipient immunosuppressive therapy, the
improvement comprising:
 contacting the transplant with a vesicle of claim 20.

10 37. A method of treating a transplant, comprising:
 administering to the transplant:
 a T cell-apoptosis-inducing molecule, and
 a vesicle, comprising
 (i) a means for binding the T cell-apoptosis-inducing
15 molecule, and
 (ii) a phospholipid which is a stable vesicle former,
 wherein the vesicle has a fusion rate of at least 20 vesicle fusions/second.

20 38. The method of claim 37, comprising the sequential steps of:
 (i) administering the vesicles to the transplant; and
 (ii) administering the T cell-apoptosis-inducing molecule to the
transplant.

25 39. A method of treating a transplant already transplanted according to
the method of claim 37.